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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/671,864

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Ralph Kurt

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EXAMINER

CHACKO DAVIS, DABORAH

ART UNIT

PAPER NUMBER

1756

MAIL DATE

DELIVERY MODE

07/13/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/671,864

Applicant(s)

KURT ET AL.

Examiner

Daborah Chacko-Davis

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2 and 4-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2, 4-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 4-6, 8-20, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,225,032 (Hasegawa et al., herein after referred to as Hasegawa) in view of Journal of Crystal growth 222 (2001) 452-458 (McGinnis et al, herein after referred to as McGinnis) and in view of U. S. Patent No. 6,252,648 (Hase et al., hereinafter referred to as Hase).

Hasegawa, in the abstract, in col 3, lines 60-67, in col 4, lines 1-67, in col 5, lines 58-67, in col 6, lines 12-67, in col 7, lines 1-13, and lines 38-67, in col 8, lines 1-24, in col 11, lines 10-39, and lines 64-67, in col 12, lines 4-19, and in figure 2, discloses a lithographic system comprising a light source that provides a laser beam (a radiation system), a support (driving device) that supports the mask, a substrate table (reference 18, stage) that supports the wafer, an irradiation source that irradiates a resin blank (resist coated substrate) through a mask, wherein the laser beam irradiates gaseous molecules of tetrafluoromethane (positioned near the discharge port) in the chamber (the apparatus contains the composition), and gas is introduced via ports so as to flow in the path of the laser beam through the space in the laser processing apparatus i.e., the space or portion between the light source and the wafer that includes at least a

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projection optical system (reference 15), and a laser oscillator; the  $\text{CF}_4$  gases are irradiated with ArF laser (DUV source, the activating device) so as to activate the fluorine containing substance(i.e., exciting the molecules), and forms fluorine in the space (processing part) (claims 1, 4, 11-17, and 19-20). Hasegawa, in col 11, lines 64-67, discloses that gases such as rare gases (inert gases) are introduced into the apparatus via laser oscillator (claim 2). Hasegawa, in col 9, lines 9-60, discloses that the fluorine-containing compound is encapsulated in a microporous media (sponge) (claim 18).

The difference between the claims and Hasegawa is that Hasegawa does not disclose that the composition used removes a contaminant from a surface of the apparatus. Hasegawa does not disclose that the composition is a compound that includes one or more nitrogen atoms (claim 8). Hasegawa does not disclose that the one or more compounds include one or more nitrogen hydrides (claim 5). Hasegawa does not disclose that the one or more compounds includes at least one of ammonia, diazine, hydrazine, and salts thereof (claim 6). Hasegawa does not disclose that the composition includes nitrogen dioxide (claim 9). Hasegawa does not disclose that the composition includes one of the gases recited in claim 10.

McGinnis, on page 452-453, discloses that the ammonia flux is introduced into the plasma atmosphere, i.e., a composition that includes one or more nitrogen atom, and is a nitrogen hydride, and includes upon dissociation due to irradiation with plasma hydrogen atoms and nitrogen atoms, prior to exposing the substrate.

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The difference between the claims and Hasegawa in view of McGinnis is that Hasegawa in view of McGinnis does not disclose that the composition used removes a contaminant from a surface of the apparatus. Hasegawa in view of McGinnis does not disclose that the composition includes nitrogen dioxide (claim 9).

Hase, in col 3, lines 32-54, in col 4, lines 38-60, and in col 5, lines 33-35, discloses that the composition in the exposure apparatus can be utilized to clean the surfaces of the exposure apparatus (includes optical element). Hase, in col 4, lines 1-60, discloses that the oxygen and nitrogen is mixed in the projection system and impinged with a laser light treatment that inherently produces oxides including oxides of nitrogen (nitrogen dioxide).

Therefore, it would be obvious to a skilled artisan to modify Hasegawa by introducing the plasma atmosphere with ammonia because McGinnis, in the abstract, discloses that the ammonia flux introduced into the plasma beam resulted in the inhibition of surface roughening and produced a relatively smooth substrate surface. Therefore, it would be obvious to a skilled artisan to modify Hasegawa in view of McGinnis by purging nitrogen and oxygen via the illumination system (projection system) as suggested by Hase because Hase, in col 4, lines 38-64, and in col 5, lines 1-5, discloses that introducing nitrogen with small controlled amounts of oxygen enables the formation of ozone which in turn oxidizes any organic compounds deposited on optical elements and thus performs ozone cleaning of optical elements, also enabling cleaning during the stand-by period and/or during an actual operation of the exposure apparatus.

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3. Claim 7, is rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,225,032 (Hasegawa et al., herein after referred to as Hasegawa) in view of Journal of Crystal growth 222 (2001) 452-458 (McGinnis et al, herein after referred to as McGinnis) as applied to claims 1-2, 4-6, 8, and 10-20, above and further in view of U. S. Patent No. 5,320,707 (Kanekiyo et al, hereinafter referred to as Kanekiyo).

Hasegawa in view of McGinnis is discussed in paragraph no. 2.

The difference between the claims and Hasegawa in view of McGinnis is that Hasegawa in view of McGinnis does not disclose that the one or more compounds include nitric acid (claim 7).

Kanekiyo, in col 23, lines 65-68, discloses that the nitric acid is introduced into the plasma to perform passivation processing on the laminate layers.

Therefore, it would be obvious to a skilled artisan to modify Hasegawa in view of McGinnis by introducing the plasma atmosphere with nitric acid because Kanekiyo, in col 23, lines 65-68, and in col 24, lines 1-2, discloses that nitric acid passivation enables the removal of residues on the laminate layer prior to development (washing processing).

#### ***Response to Arguments***

4. Applicant's arguments, see Remarks, filed March 15, 2007, with respect to the 103 rejection of Hasegawa in view McGinnis, have been fully considered and are persuasive. The 103 rejection of Hasegawa in view McGinnis, made in the previous office action (paper no. 0516) over claims 1-2,4-6,8,10-120, have been withdrawn.

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However, upon further consideration, a new ground(s) of rejection is made in view of U. S. Patent No. 6,252,648 (Hase et al., hereinafter referred to as Hase).

A) Applicants argue that Hasegawa and McGinnis are non-analogous references for the rejections.

Hasegawa teaches an apparatus that has a radiation system that provides a beam of radiation (a laser processing apparatus with laser beam as the light source), a mask that is supported by a driving device, a workpiece i.e., a resin blank that is supported on a movement stage, and a projection optical system i.e., Hasegawa discloses the same apparatus as that recited in claim 1. McGinnis is not depended upon to disclose a lithographic apparatus. McGinnis is depended upon to disclose the use of a nitrogen-containing compound that is introduced in an atmosphere that is irradiated with a high energy beam.

B) Applicants argue that Hasegawa et al., does not disclose a composition to remove a contaminant from a surface of the apparatus.

Hasegawa in view of McGinnis discloses the use of the claimed composition that is irradiated by a laser. However, Hase teaches that the composition that is exposed to laser irradiation can be utilized to clean the surface of the exposure apparatus.

### ***Conclusion***


5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's

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supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd



July 7, 2007.